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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/734,136 | 12/15/2003 | In-Taek Han | 030681-605 | 9231 |

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EXAMINER

HINES, ANNE M

ART UNIT PAPER NUMBER

2879

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/734,136

Applicant(s)

HAN, IN-TAEK

Examiner

Anne M. Hines

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 2,4 and 6-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/15/03 & 5/19/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/19/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed on May 19, 2004, has been entered and acknowledged by the Examiner.

Claims 1-12 are pending in the instant application.

Specification

The disclosure is objected to because of the following informalities: On page 5, line 31 an ITO electrode in figure 5 is referred to with number 22, instead of 23 as is shown in figure 5. Also on page 5, line 33 the letter "f" is extraneously inserted between the words "first" and "electric". Appropriate correction is required. Applicant's cooperation is requested in correcting any further errors of which applicant may become aware in the specification.

Drawings

The drawings received on December 15, 2003 are objected to because: In figure 3 the power source for the device is shown as connected to the back electrode and the first dielectric layer, instead of the ITO electrode, as is shown correctly in figure 2; One of ordinary skill in the art would know that the device will not operate as drawn.

The drawings received on May 19, 2004 are objected to because: In figures 6, 7, and 8 the photographs are not of sufficient quality so that all details in the photographs are reproducible in the printed patent. See 37 CFR 1.84 (b) (1).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 9 is objected to because of the following informalities: The phrase "...a second electric field enhancing layer which is formed on the second substrate so as to contact the dielectric layer on the first substrate; a second dielectric layer which is formed on the second electric field enhancing layer..." is unclear because, in view of figure 5, the second electric field enhancing layer does not physically contact the dielectric layer on the first substrate (first dielectric layer). Appropriate correction is

Art Unit: 2879

required. Examiner has treated claim 9 on its merits assuming that the phrase "so as to contact the dielectric layer on the first substrate" has been struck from the claim.

Additionally, the drawings must show every feature of the invention specified in the claims.

Claim 10 is objected to because of the following informalities: Claim 10 is unclear because in the phrase "...and the back electrode and the electric field enhancing layer are formed on the second substrate" is unclear since the electric field enhancing layer is not specified as either the first or the second electric field enhancing layer. Additionally, claim 10 contradicts claim 9. In claim 9: the transparent electrode, the first electric field enhancing layer, and the first dielectric layer are formed on the first substrate; the back electrode, second field enhancing layer, and second dielectric layer are formed on the second substrate; and the inorganic light-emitting layer is present between the first and second dielectric layers. However, in claim 10: the transparent electrode, the first electric field enhancing layer, the first dielectric layer, the inorganic light-emitting layer, and the second dielectric layer are formed on the first substrate. The examiner has treated claim 10 on its merits assuming that the device is formed as specified in claim 9, see examiners objection to claim 9 above. Appropriate correction is required.

Claims 6 and 10 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The limitations

Art Unit: 2879

disclosed in claim 6 are already disclosed in claim 5. The limitations disclosed in claim 10 are already disclosed in claim 9.

Double Patenting

Applicant is advised that should claim 7 be found allowable, claim 8 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. Also, should claim 11 be found allowable, claim 12 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 5, 6, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Antson et al. (US Pat. No. 4,416,933).

Regarding claim 1, Antson discloses an inorganic electroluminescent device comprising: a substrate (Fig. 1, 1; Column 3, lines 24-25), a transparent electrode (Fig.

Art Unit: 2879

1, 2; Column 4, lines 25-26) which is formed on the substrate, an inorganic light-emitting layer (Fig. 1, 6; Column 4, lines 58-59) which is formed on the electrode, a dielectric layer (Fig. 1, 4; Column 3, lines 27-28) which is formed on the inorganic light-emitting layer; and a back electrode (Fig. 1, 10; Column 3, line 33) which is formed on the dielectric layer, wherein an electric field enhancing layer is present between the dielectric layer and the back electrode (Fig. 1, 3; Column 4, lines 27-33; Column 4, lines 37-43).

Regarding claim 3, Antson discloses an inorganic electroluminescent layer comprising: an inorganic light-emitting layer; upper and lower dielectric layers (Fig. 1, 4 & 8; Column 3, lines 27-32) which are formed above and below the light-emitting layer, respectively, and form a sandwich structure together with the light-emitting layer (Fig. 1, 6; Column 4, lines 58-59); upper and lower electrodes (Fig. 1, 2 & 10; Column 3, lines 26-33) which are formed above and below the sandwich structure, respectively, a substrate (Fig. 1, 1; Column 3, lines 24-25) which is a main frame of the above stacked structures, wherein an electric field enhancing layer is present at at least one of an interface between the upper electrode and the upper dielectric layer which contacts the upper electrode, and an interface between the lower electrode and the lower dielectric layer which contacts the lower electrode (Fig. 1, 3; Column 4, lines 27-33; Column 4, lines 37-43).

Regarding claims 5 and 6, Antson discloses an inorganic electroluminescent device comprising: first and second substrates (Fig. 1, 1 & 1'; Column 3, lines 24-35) which are arranged opposite to each other; a transparent electrode which is formed on

Art Unit: 2879

the first substrate (Fig. 1, 2; Column 4, lines 25-26), an inorganic light-emitting layer which is formed on the transparent layer (Fig. 1, 6; Column 4, lines 58-59); a dielectric layer which is formed on the light-emitting layer (Fig. 1, 8; Column 3, lines 31-32), a back electrode which is formed on the second substrate (Fig. 1, 10; Column 3, line 33), and an electric field enhancing layer which is formed on the back electrode so as to contact the dielectric layer on the first substrate (Fig. 1, 3; Column 4, lines 27-33; Column 4, lines 37-43).

Regarding claims 9 and 10, Antson discloses an inorganic electroluminescent layer comprising: first and second substrates (Fig. 1, 1 & 1'; Column 3, lines 24-35) which are arranged opposite to each other; a transparent electrode which is formed on the first substrate (Fig. 1, 2; Column 4, lines 25-26), a first electric field enhancing layer which is formed on the transparent electrode (Fig. 1, 3; Column 4, lines 27-33; Column 4, lines 37-43), a first dielectric layer which is formed on the transparent electrode (Fig. 1, 4; Column 3, lines 27-28), a back electrode which is formed on the second substrate (Fig. 1, 10; Column 3, line 33), a second electric field enhancing layer which is formed on the second substrate (Fig. 1, 9; Column 4, lines 27-33; Column 4, lines 37-43), a second dielectric layer which is formed on the second electric field enhancing layer (Fig. 1, 8; Column 3, lines 27-28), and an inorganic light-emitting layer which is present between the first and second dielectric layers (Fig. 1, 6; Column 4, lines 58-59).

Allowable Subject Matter

Claims 2,4, 7, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 2, and specifically comprising the limitation wherein the electric field enhancing layer of claim 1 is formed of carbon nano tubes or nano particles.

Regarding claim 4, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 4 respectively, and specifically comprising the limitation wherein the electric field enhancing layer is formed of carbon nano tubes.

Regarding claim 7, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 7, and specifically comprising the limitation wherein the electric field enhancing layer is formed of carbon nano tubes.

Regarding claim 11, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 11, and specifically comprising the limitation wherein the electric field enhancing layer is formed of carbon nano tubes.

Other Prior Art Cited

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

| | |
|-----------------|-----------------------|
| Lindmayer | US Pat. No. 4,748,375 |
| Horiuchi et al. | US Pat. No. 6,921,575 |
| Hsu | US 2004/0206942 |

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached on Monday through Friday from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anne M Hines
Patent Examiner
Art Unit 2879

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8/23/05

AmH 8/29/05
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PRIMARY EXAMINER